

## ABSTRACT OF THE DISCLOSURE

The present invention discloses eight new reduced dimensionality (RD) triple resonance nuclear magnetic resonance (NMR) experiments for measuring chemical shift values of certain nuclei in a protein molecule. The RD 3D  $\underline{\text{H}}\underline{\text{A}}\underline{\text{C}}\underline{\text{A}}_1(\text{CO})_1\text{N}_1\text{HN}$  NMR experiment and the RD 3D  $\underline{\text{H}}\underline{\text{C}}_1(\text{C-TOCSY-CO})_1\text{N}_1\text{HN}$  NMR experiment are designed to yield "sequential" connectivities, while the RD 3D  $\underline{\text{H}}^{\alpha\beta}\underline{\text{C}}^{\alpha\beta}\text{CO}_1\text{HA}$  NMR experiment and the RD 3D  $\underline{\text{H}}^{\alpha\beta}\underline{\text{C}}^{\alpha\beta}\text{N}_1\text{HN}$  NMR experiment provide "intraresidue" connectivities. The RD 3D  $\underline{\text{H}}\underline{\text{C}}_1\text{C}_1\text{H-COSY}$  NMR experiment, the RD 3D  $\underline{\text{H}}\underline{\text{C}}_1\text{C}_1\text{H-TOCSY}$  NMR experiment, and the RD 2D  $\underline{\text{H}}\underline{\text{C}}_1\text{H-COSY}$  NMR experiment allow one to obtain assignments for aliphatic and aromatic side chain chemical shifts, while the RD 2D  $\underline{\text{HB}}\underline{\text{CB}}_1(\text{CG,CD})_1\text{HD}$  NMR experiment provide information for the aromatic side chain chemical shifts. In addition, a method of conducting suites of RD triple resonance NMR experiments for high-throughput resonance assignment of proteins and identification of the location of secondary structure elements are disclosed.

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